

Abstract

A solid-state nuclear magnetic resonance (NMR) method for investigating a sample material, which contains protons H and also spin-1/2 hetero nuclei X, uses a sample material rotated at the magic angle. The method comprises the steps of increasing the equilibrium polarization of X; eliminating (2) proton magnetization; transferring polarization from X to H; and recording the proton signals (8) under a condition of line narrowing. A radio frequency (RF) pulse sequence effects polarization transfer between X and the closest protons H, via dipole coupling with coupling constant D_{XH} . A parameter, which is associated with the transfer process, is varied to determine the dipole coupling constant D_{XH} and thereby permits precise determination of the binding separation X-H, even when the concentration of X is small compared to H.